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ABSTRACT

The State of Florida and local mandates require that a diagnostic/prescriptive systems approach to reading and mathematics instruction be available to all students at grade levels K-6. It has been demonstrated that the Dade County Systems approaches are viable alternatives to non-systems approaches to reading and/or mathematics instruction. Results of the study of second and third year participation in Dade's Systems programs provide clear evidence that: (1) participants performed better the longer they were in the programs, and (2) after a second year in the program the percentages of communication and mathematics skill items answered correctly on the Florida State Assessment Test was higher than the percentages achieved by non-systems pupils. This held true for all categories of objectives and the total as well. Participants of the High Intensity Reading Program, on the other hand, have for the second year, demonstrated negative results in reading comprehension and communication skills tests. Consequently, Dade Systems programs are recognized as a more beneficial mode for delivering basic skills instruction than non-systems programs and are unequivocally recommended as appropriate diagnostic/prescriptive programs into which to phase non-systems pupils. (Author/MV)

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SUMMARY OF PRINCIPAL FINDINGS AND RECOMMENDATIONS

As of April 1976, Dade County was nearing compliance with state and local mandates, requiring the availability to all pupils of a diagnostic/prescriptive systems approach to reading and mathematics instruction within grade levels K-6. At that time, about 79 percent, 96,940, of the approximately 22,445 pupils in grades K-6 in Dade County were using a systems approach for reading instruction and 75 percent, 92,201 pupils, were using the systems approach for math instruction. Table I presents a grade level summary of the numbers of systems participants as of April 1976.

Dade County Systems approaches accommodated the majority of all systems pupils. Sixty-three percent of the pupils in reading systems were in Dade's Reading System and 90 percent of the systems math pupils received their math instruction via Dade's Math System.

For the second year in a row, Dade County Systems approaches to reading and mathematics instruction have demonstrated via the Stanford Achievement Test and the Statewide Assessment Program that they are viable alternatives to non-systems approaches to reading and/or mathematics instruction.*

Also, results of the study of second and third year participation in Dade's Systems programs provide clear evidence that: 1) Dade's Systems' participants performed better the longer they were in the programs, and 2) after a second year in the program the percentage of communication skills and mathematics skills items they obtained on the Florida State Assessment test was superior to the percentages of items achieved by non-systems pupils. This held true for all categories of objectives and the total as well.

Consequently, Dade Systems programs are recognized as a more beneficial mode for delivering basic skills instruction than non-systems programs and are unequivocally recommended as appropriate diagnostic/prescriptive programs into which to phase non-systems pupils.

Because of the favorable findings from two successive evaluations, further evaluation of the effectiveness of systems approaches does not appear warranted.

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*1974-75 Evaluation of Dade County's Systems Approaches to Reading and Mathematics Instruction Grades 2-6. Department of Planning and Evaluation, Dade County Public Schools, March 1976.

This study was recently designated by Division H of the American Educational Research Association as the evaluation report with "best research design" for 1974-75. This current study largely replicates that design but extends the analysis to second and third year participants in the program.

In addition to Dade's Systems programs, Wisconsin Design/Dade Systems,** Holt Reading Systems and the Individualized Math Systems (IMS), also, demonstrated good effects in the reading amd mathematics skills areas, respectively.

Principals are advised that each of those programs afford reliable options to both Dade's Systems approaches and non-systems approaches to instruction.

Participants of the High Intensity Reading Program, on the other hand, have for the second year, demonstrated negative results in reading comprehension and communication skills tests. It is recommended, therefore, that elementary school level administrators consider discontinuing the use of the High Intensity program.

In general, educators agree that the diagnostic/prescriptive process offers great promise for maximizing achievement gains for individual pupils in the basic skills areas. They are also in agreement that, while the impact on pupil achievement may be improved by the use of individualized programs, such programs are difficult to implement and maintain.

Dade County in recognition of this limitation has expended considerable effort to: 1) properly train systems reading and math instructional personnel, and 2) to insure the proper implementation of systems programs.

It is largely due to the vigilant program support efforts, organized at the area and district levels, that pupils in the complex innovative systems programs have been successful, particularly, after the second and third years of program participation. It is recommended, therefore, that the district, in concert with the school level and administrative area level personnel, maintain its high level of interest and support of systems programs in order to insure that both the Systems Reading and Systems Math programs achieve and maintain the status of being fully operational.

The impact of support personnel on the relative success of systems cannot be determined. Budget deliberations to date, however, would eliminate most of these personnel from the 1977-78 budget. Whether systems approaches to basic skills instruction will continue as viable instructional delivery vehicles with the elimination of such support personnel must at this time remain an open question.

**The Wisconsin Design/Dade Systems approach to reading instruction occurred in those classrooms where the teacher used the Wisconsin Design for teaching decoding skills and Dade's Reading System for teaching comprehension skills.

DADE COUNTY PUBLIC SCHOOLS

Division of Finance

1975-76 EVALUATION OF DADE COUNTY'S SYSTEMS APPROACHES TO READING AND MATHEMATICS INSTRUCTION GRADES 2 - 6

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May, 1977

TABLE OF CONTENTS

	PAGE
OVERVIEW OF DADE COUNTY SYSTEMS	1
DESCRIPTION OF THE EVALUATION	3
CONCLUSIONS	9
RECOMMENDATIONS	13
RESULTS	15
Program Implementation Characteristics	15
Program Impact on Pupil Achievement	17
Effects on Achievement of the Second and Third Years of Participation in Dade Systems Programs	25

LIST OF TABLES

TABLE		PAGE
1	Number of Systems Pupils and Teachers Within Grade Levels (K-6) by Type System as of April, 1976	16
2	Stanford Achievement Reading Comprehension Mean Gain Scores Comparisons of Systems and Non-Systems Pupils, Grade Levels 2 - 6	18
3	Third Grade State Assessment Communication Skills Comparisons.	19
4	Fifth Grade State Assessment Communication Skills Comparisons	20
5	Stanford Achievement Mathematics Computation Mean Gain Scores Comparisons of Systems and Non-Systems Pupils, Grade Levels 2 - 6	22
6	Third Grade State Assessment Mathematics Skills Comparisons	23
7	Fifth Grade State Assessment Mathematics Skills Comparisons	24
8	Effects on the Percent of Fifth Grade State Assessment Communication Skills obtained by One, Two or Three Years Participation in Dade's Systems Reading Program	26
9	Effects on the Percent of Fifth Grade State Assessment Mathematics Skills Obtained by One, Two or Three Years Participation in Dade's Systems Mathematics Program.	27
10	Grade Five Total Communication Skills Comparisons Among First, Second and Third Year Dade Systems Reading Pupils and Non-Systems Reading Pupils	28
11	Grade Five Total Mathematics Skills Comparisons Among First, Second and Third Year Dade Systems Math Pupils and Non-Systems Math Pupils	28

OVERVIEW OF DADE COUNTY SYSTEMS

Dade County's Systems approach to Reading and Mathematics is an instructional assessment/management structure which provides for the acquisition of appropriate reading and mathematics skills for individual pupils. Systems includes an organized series of skills stated as performance objectives, assessment tests to indicate mastery of these objectives, and instructional materials and procedures designed to teach the identified skills which individual pupils require in order to achieve mastery of the objectives.

Dade Systems is really two programs, Dade Reading Systems and Dade Mathematics Systems. These programs were first piloted and field tested during the 1971-72 school year at selected elementary schools within the county. By April, 1976, there were 83,137 pupils and 2,866 teachers involved in Dade Systems Mathematics and 61,071 pupils and 2,123 teachers using the Dade Systems Reading Program.

Dade County Reading Systems

This system includes provisions for the testing of both decoding (word attack) and comprehension skills. It contains decoding and comprehension objectives which are assigned to categories and are assessed in pupil assessment booklets. Placement tests are available also, one for decoding and one for comprehension. An instructional kit for decoding which contains detailed lesson plans to teach specific phonics skills has been developed by the Division of Instructional Planning and Support and has been distributed to all elementary schools along with a teacher support package designed to reduce the length of time needed by teachers to develop decoding skills lesson plans. Also, three instructional kits for comprehension skills have been developed and distributed to all elementary schools. These kits contain detailed lesson plans for teaching all the specific comprehension skills within the system, student lesson sheets, and independent activity work books.

Both kits, the decoding and the comprehension, which were distributed at no cost to the elementary schools are also commercially available through the Hoffman Publishing Company.

Dade County Mathematics Systems

The state of Florida within its state assessment project developed a set of objectives, K-12, which provided basic guidelines for mathematics instruction within the state. Further, in order to make the objectives which span K-8 more manageable, the objectives were placed in 28 developmental levels and cover the complete span of math concepts.

Dade Mathematics Systems, like the Dade Reading Systems, contain diagnostic placement tests, student profile instructional prescription sheets, key-coded references to instructional materials for developing specific skills, administrative manuals, and teacher training moduals.

For a detailed overview of Dade Math Systems, consult the Dade County Systematic Approach to Elementary Mathematics Instruction, Division of Instructional Planning and Support.

Significantly, both the reading and the math Systems* were designed to utilize most of the instructional materials and equipment traditionally housed in the elementary schools.

Commercially Produced Systems Programs

In addition to Dade's, there were a number of commercial reading and math systems which had been installed throughout the county. Those commerical systems which were thought to have been installed on a sufficiently broad scope to become part of the evaluation are listed below. The commercial reading systems include the following:

1) Wisconsin Design for Reading Skills (decoding and comprehension), 2) Wisconsin Design/Dade Systems, 3) High Intensity Learning Systems, 4) READ System (American Book), 5) Criterion Reading (Random House), 6) Fountain Valley Teacher Support System, 7) Appleton Century Croft (New Century Education), 8) Holt Basic Reading Systems, 9) Design For Reading Series (Harper Row), 10) Reading Systems (Scott-Foresman), 11) SWRL Beginning Reading Program, 12) Series R (Macmillan), and 13) Global Skills (New Century).

The commercial math systems analyzed within this study include the following:

1) Individualized Math System (IMS), 2) Individualized Program Instruction (IPS), 3) Appleton Century Croft (New Century Education), and 4) Early Childhood Mathematics Program.

"Other reading" and "other mathematics" systems refer to those reading and math programs which were primarily of teacher design. Those teachers who felt they were using a diagnostic/prescriptive systems approach which was neither Dade County's or of a recognizable commercial design identified the program as an "other" system and the principal then observed the program and determined if the program met basic criteria.

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*Where "Systems" is capitalized, the reference is specifically to the locally developed instructional systems.

DESCRIPTION OF THE EVALUATION

The purpose of this 1975-76 evaluation of Dade Systems Programs was two-fold. The first effort was to detail the extent to which diagnostic/prescriptive systems reading and math programs had been implemented throughout Dade County and to pass on detailed summaries of the numbers of teachers and pupils involved with the various systems programs within each school. The intent of this effort was to provide information which would be useful to school and district administrative personnel in determining grade levels and basic skills areas where concentrated program implementation and staff development efforts were needed. The second objective of this evaluation was to detail the comparative effects on pupil progress for systems program participants (Dade County's Systems and others).

Program Implementation

Data relevant to the implementation of systems programs were generated from two sources: 1) principals' and/or assistant principals' systematic on-site observations of systems classrooms, and 2) principals' and systems teachers' responses to questionnaire inquiries concerning salient program operation factors.

The observations, which were organized and conducted by the administrative staffs at each elementary school, served the main function of identifying classrooms where curriculum support services could best be utilized. Concurrently, the accuracy of the systems classifications was confirmed or denied.

An additional function of the classroom observations was to determine which of the systems installations had been fully implemented. For the purpose of this evaluation, a fully implemented systems installation was one which demonstrated seven out of seven components considered necessary in fully implementing either a reading or math systems installation.

The seven essential systems components are as follows: 1) Diagnostic data had been recorded on group or individual profiles. 2) Assessment booklets and/or answer sheets were in evidence. 3) Individual activities and/or teacher-directed instructional activities were based on diagnostic information. 4) Pupils working independently on assigned tasks were able to successfully perform the tasks. 5) There was evidence of organized pupil activity. 6) Provision for immediate feedback on pupils' independent work was in evidence. 7) There was evidence of regular library and trade book reading.

Components one through six were essentially the same for reading and math installations; however, the seventh component listed was applicable only for reading. The seventh math component asked for evidence of learning center operations.

The survey of systems operations procedures was conducted via a computer-processable Systems Response Sheet which was addressed to principals and teachers who were involved with specific Systems

programs. Essentially, the survey sought information such as 1) teacher aide information, 2) type system, 3) grade level, 4) school, 5) pupil identification (the teacher identified all students who were in her specific systems class), 6) various funding sources for systems program teachers, and 7) systems implementation data (the principal was responsible for certifying a systems class as fully implemented or not fully, or marginally implemented).

As a point of interest, during the month of July, 1976, summaries of the number of teachers and pupils involved with each system's program within each grade level within each of the 172 elementary schools, were sent to elementary principals. Administrative area summaries along with the summaries for each school in the area were sent to each administrative area superintendent. The district area summaries along with the administrative area level and school level summaries were fowarded to the district superintendent's office. The purpose of the summaries was to provide information to county level, administrative area level, and school level administrative staffs that would be of value in determining where reading and math systems personnel training and program support efforts were most needed for fully implementing diagnostic/prescriptive basic skills programs for all pupils in grades K-6

Pupil Progress

Essentially, this evaluation effort sought answers to the following questions in relation to pupil progress.

First, did the Dade County's Systems pupils perform as well on reading and/or math achievement tests as non-systems pupils (pupils who were taught reading and mathematics in classrooms where there were no identifiable systems programs)?

Second, did the achievement patterns in either reading or mathematics vary substantially, as a result of their participation in specific systems programs, Dade County's or others, for clusters of students who previously demonstrated either low (stanines 1-3), average (stanines 4-6), or high achievement levels (stanines 7-9) on the Stanford Achievement test, may 1975?

Third, how well did Dade Systems participants perform on achievement tests in relation to participants of systems reading and math programs other than Dade County's?

Fourth, did pupils who had been in Dade Systems Reading or Math Programs for the second and third years have higher levels of achievement than one year systems pupils?

Testing

Data relevant to the above questions were generated from 1) the county-wide testing programs involving the math computation and paragraph meaning subtests of the Stanford Achievement Test, a nationally standardized test administered to all students in grades one through twelve, and 2) the Florida Statewide Assessment Program of communication and mathematics skills administered to pupils in grades three and five.

These tests differ with respect to the type of instrument utilized, the use of their results, and their geographic scope.

First, the Stanford test was given to nearly all Dade students, at all grade levels, in May, 1976, and measured student performance in the areas of reading comprehension, mathematics computation, and mathematics concepts. For this test, results are given in terms that relate a student's (or school's) performance to that of a representative national sample called a "norm group". As a consequence, the Stanford is called a "norm-referenced" test. Scores on the Stanford are, then, a relative rather than an absolute measure of achievement.

Second, the Florida State Assessment Test was administered in October of 1976. Results of this testing program for individual students, schools, the county, and the state are given in terms of the extent to which respondents "pass" the many individual objectives measured by the tests. These objectives represent basic skills that most pupils should master at certain critical grades. The questions asked in the tests are developed from priority objectives as established by the State Department of Education. The advantage of these tests is that they provide performance measures on many important skills.

In an effort to facilitate the interpretation of the results of the State Assessment test, individual objectives for mathematics and communication skills in grades three and five were identified as members of larger sets or clusters of objectives which bore a logical relationship to each other. The regrouping of the individual objectives into broader, more interpretable clusters was undertaken by Dade County's reading and mathematics consultants.

Selection of Sample

All pupils in grades two through six who had participated in Dade County's achievement testing program and/or participated in the October, 1976, Statewide Assessment Program were included in these analyses as members of Dade Systems, commercial systems, or non-systems programs.

Procedures for associating a specific pupil with a specific treatment (type of reading or math instructional program) included the following:

Systems Pupils. Teachers, who had been identified by their principals as using a systems approach for reading and mathematics instruction, sent rosters of pupils who had participated for at least five months in their specific program.

Ultimately, the pupil rosters were separated into two groups, those which had been involved in fully implemented systems installations and those which had not. Only the reading and math achievement results of pupils from fully implemented systems programs and non-systems programs were utilized in comparing systems and non-systems program effects.

One, Two, and Three-Year Dade Systems Pupils. Pupils who had experienced at least five months of Dade Systems Reading or Mathematics programs during the 1975-76 school year, who had not previously participated in

any other systems program, and took the May, 1974, countywide achievement tests and the October, 1976, Statewide Assessment Tests were included as one-year Dade Systems participants. Pupils who met the above criteria and who had also been Dade Systems participants since the 1974-75 school year were included in the analyses as two-year Dade Systems pupils. Third-year pupils were those who had been program members since the 1973-74 school year.

Non-Systems Pupils. Finally, non-systems pupils (pupils who were not involved in a systems reading or math program) had to be identified. This was accomplished by subtracting all the pupils who had participated in any type of systems program from the complete listing of pupils enrolled in grade levels two through six.

Data Analyses

Countywide (Stanford Achievement Test). Equalization of significant pre-treatment characteristics (grade level, gender, ethnicity, test form, and pre-test scores) of the student members of the various treatment groups was essential in order to meaningfully compare the effects of the various programs on reading and math achievement scores. Two procedures were employed in the efforts to equalize these pre-treatment pupil characteristics.

First, the expected score procedure which was developed by the Evaluation Section for use in its analysis of countywide achievement results was used. This procedure was elaborated in the report entitled Achievement in Dade County Schools, 1972-73, pages 3-5. Portions of that statement are included below for purposes of clarification.

> In Dade County, the procedure of comparing a student's score with expectations based upon pupils of similar background and identical achievement scores is carried out on a massive scale. Every pupil that participated in the testing program for two successive years is examined for the degree to which his (her) current achievement differs from expectations determined from his background and previous achievement.
>
> As an example of this procedure, a student in fourth grade in school Z during 1972-73 would have his (her) reading score compared to the following expectation:
>
> The 1972-73 average reading score for all the pupils in the county in 1971-72 who were of the same sex, the same ethnic origin, were third graders, took the same form of the Stanford Achievement Test in reading and scored the exact reading score in 1971-72.
>
> A second expected score would be determined for the student's mathematics achievement in the same manner.

The student's 1972-73 actual or "attained" reading and mathematics scores are compared to the expected scores by a simple subtraction. This yields difference scores which may indicate the pupil is achieving higher, equal to, or lower than was expected for him (her) in each of the areas, reading and mathematics.

Second, in addition to the use of the expectancy procedures for equating students on pre-treatment characteristics, pupils were subdivided into low, average, and high achievement clusters on the basis of stanine* rankings on the May, 1975, Stanford Achievement Test. Low achievers were classified as stanine cluster 1-3, average achievers as stanine cluster 4-6, and high achievers as stanine cluster 7-9. This stanine grouping procedure was used for the purpose of examining the effects of various systems and non-systems programs for clusters of pupils of varying levels of pre-treatment characteristics of reading and math achievement.

Florida Statewide Assessment, October, 1976

In order to simplify this report, the large list of objectives for each skills area was condensed into a smaller number of skills categories or clusters as mentioned previously in the testing section of this report.

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*Stanines are transformed or normalized units which enables scores to be organized in a consistent fashion from one grade to another. Stanine scores are derived by dividing the range of skill encompassed by each grade-level test into nine equal portions. The middle three stanines - 4, 5, and 6 - denote "about average" levels of achievement. Grade-level performance at each grade is at about the middle of stanine five. The lower three stanines denote progressively lower, and the three higher stanines progressively higher, levels of achievement.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions based on the results of the evaluation of the 1975-76 Dade Systems approaches to reading and mathematics instruction are presented in three parts in this section: 1) conclusions concerning the implementation characteristics of systems programs, 2) conclusions concerning the comparative effects of various systems (Dade County's and others) and non-systems programs on pupil progress in the basic skills areas of reading and mathematics, and 3) the effects on achievement of one, two and three years of participation in Dade's Reading and Math Systems Programs.

PROGRAM IMPLEMENTATION

As of April, 1976, within grade levels K-6, Dade County was nearly in compliance with state and local mandates requiring the availability to all pupils of a diagnostic/prescriptive systems approach to reading and mathematics instruction. At that time, about 79 percent, 96,940, of the approximately 122,445 pupils in grades K-6 in Dade County were using a systems approach for reading instruction and 75 percent, or 92,201, pupils were using a systems approach for math instruction.

Dade County Systems approaches accommodated the majority of all systems pupils. Sixty-three percent of the pupils in reading systems were in Dade's Reading System and 90 percent of the systems math pupils received their math instruction via Dade's Math System.

In summary, as of April, 1976, the majority, 75-79 percent, of Dade's K-6 pupils were receiving the basic skills, reading and mathematics, via a diagnostic/prescriptive reading and mathematics program.

PROGRAM IMPACT ON PUPIL ACHIEVEMENT

Two different types of tests were used to measure pupil progress. First, the Stanford Achievement Test, a norm-referenced test, was given to nearly all pupils at all grade levels, and measured student performance in the areas of reading comprehension, mathematics computation, and mathematics concepts. Only the reading comprehension and the mathematics computation subtests were used in this evaluation.

Second, a criterion-referenced test of the Florida State Assessment Program was administered in October, 1976. Results of this testing program for individual students, schools, the county, and the state are given in terms of the extent to which respondents "pass" the many individual objectives measured by the test. These objectives represent basic skills that most pupils should master at certain critical grades.

Conclusions resulting from the administration of the Stanford Achievement Test and the Florida Statewide Assessment Test are as follows:

Reading Skills

Reading Comprehension, Stanford Achievement Test, May,1976. When comparisons are made across grade levels and programs the following trends of program differences become apparent. Pupils in the Dade, Wisconsin Design/ Dade Systems, and the Holt Basic Reading Systems Programs tend

to perform about as well as expected, while High Intensity, READ Systems and "other" systems tend to perform slightly less well than expected, and less well than Dade or Wisconsin Design/Dade Systems or the Holt Basic Reading Program. Systems, not mentioned above, either evidenced inconsistent results or too few pupils to permit adequate analyses.

It was anticipated that one type of reading system program might be more effective with pupils within specific stanine clusters than some or all of the other programs. It is evident, upon examination of Table 2 that, while neither the systems or non-systems reading programs engendered greater than expected mean gains in reading achievement for low or average achieving program participants, patterns of greater than expected mean gains were demonstrated by the high achieving pupils who were participants in the Holt and the Wisconsin Design/Dade Systems Programs.

Communication Skills, Florida State Assessment, October, 1976. At grade three, Wisconsin Design/Dade Systems pupils performed slightly better than other systems programs and non-systems programs within each category of objectives and for the total of all objective clusters, as well. Dade Systems pupils tended to perform slightly better than pupils of other commercial systems programs, excepting Wisconsin's and Holt's, and better than non-systems pupils and "other" systems pupils as well.

At grade five, Dade Systems pupils performed slightly better than pupils of other systems programs, excepting READ Systems pupils, and achieved a slightly higher percentage of communication skills items than the pupils of non-systems programs and "other" systems programs, also.

Mathematics Skills

Math Computation, Stanford, 1976. In general, Dade Systems pupils performed better on the Stanford Achievement Math Computation Subtest than non-systems, "other" systems and commercial systems. However, participants of the IMS and the Appleton Century Croft Programs performed well, also. IMS participants within the high achieving group performed considerably better than expected.

Overall, the percentages of mathematics skills items achieved by Dade Math Systems pupils were quite similar to those achieved for IMS and non-systems math pupils.

There were, however, slight differences noted when the results were compared within grade levels. Specifically, Dade Math Systems pupils tended to score slightly better than IMS 's math systems pupils at the third grade level. The order was reversed at the fifth grade level with the IMS pupils out-performing Dade's Math Systems pupils.

Math Computation and Mathematics Skills. Overall, results of the Stanford Achievement Tests of math computation skills and the Florida State Assessment of total mathematics skills lead to the following conclusions:

First, a systems diagnostic/prescriptive approach to math instruction, when "fully" implemented, is a superior mode of math instruction than a non-systems approach. Second, Dade's Math System has proven to be a

beneficial math program for its participants, particularly after the second and third years of participation. Third, IMS program participants along with Dade's also performed better than non-system and "other" system math pupils. Finally, it should be noted, also, that while IMS low and average achieving participants scored about as well as expected and as well as Dade Math Systems participants, the IMS high achieving pupils performed better than expected.

EFFECTS ON ACHIEVEMENT OF THE SECOND AND THIRD YEAR OF PARTICIPATION IN DADE SYSTEMS PROGRAMS

It was noted within the 1973-74 evaluation report of systems programs that complex innovative basic skills programs need at least three years of solid operations before student performance scores should be used as indicators of program success or failure. The 1975-76 school year constituted the fourth year of Dade Systems operations. It was anticipated, therefore, that Dade Systems pupils who had been in the program for two years would score slightly better on communication and mathematics skills tests than one-year systems pupils and that third-year participants would score better than first-and second-year participants. This anticipation has been demonstrated by this evaluation.

In general, pupils tend to perform better on the State test the longer tney are participants in Dade Systems, particularly, Dade Reading Systems.

Also, it is interesting to note that Dade's Reading Systems third-year pupils consistently achieved a higher percentage of communications skills items than second-year program participants. This was not a consistent pattern for Dade's Mathematics Systems participants, whose achievement gains appeared to have stablized after the second year of program participation. The percentage of mathematics items achieved after three years in the program were approximately equal to the percentage of items achieved by second-year program participants.

A possible explanation for this occurrence might lie in the difference of the complexity of the processes of developing communication skills in relation to the complexity of the task of developing arithmetic skills. More specifically, the more complex the task, the longer period of time needed to master the skills specific to the task.

Nonetheless, Dade Systems participants did tend to perform better on the Florida Statewide Assessment after the second and third year in the program.

Also, at the conclusion of the second and third years in Dade's Systems Reading and Math programs, participants within all stanine clusters, low, average, and high, outperformed non-systems pupils of similar abilities.

RECOMMENDATIONS

The major recommendations abstracted from the discussion of program implementation characteristics, and the impact of systems programs on achievement are summarized in the following:

1. Continue efforts to implement systems reading and systems mathematics programs in pursuit of state and county goals of affording diagnostic/prescriptive programs for all Dade County pupils by the 1977-78 school year.

2. More specifically, Dade Reading and Math Systems, the Wisconsin Design/Dade System and Holt Reading Systems are three programs recommended to principals who are in the process of phasing non-systems reading pupils into a systems approach to reading instruction. The Dade Math Systems, along with the Individualized Mathematics Systems, IMS, are the two math programs recommended for phasing pupils into a systems approach to mathematics instruction.

3. Discontinue the use of the High Intensity System as an instructional program for teaching reading skills at the elementary level.

4. The district, in concert with administrative area personnel, should maintain its high level of interest and support of Systems programs in order to insure that both the Systems Reading and Systems Math programs achieve and maintain the status of being fully operational.

RESULTS

The following section presents findings of the 1975-76 evaluation of Dade's Systems Programs.

First, implementation characteristics of the reading and mathematics systems and non-systems programs are presented in Table 1, and provide a comparative overview of the extent of Dade County's efforts to implement systems, diagnostic/prescriptive, reading and math programs as of April, 1976.

Second, the effects of various systems and non-systems programs on pupils' achievement are presented in Tables 2 and 5. Program impacts on the results of the Stanford Achievement Test, a norm-referenced test, are discussed first with respect to mean gain differences achieved by pupils of various systems and non-systems programs within each grade level and across grade levels for both reading comprehension and math computation.

Next, effects of the various systems and non-systems programs on pupils' achievement in communication and mathematics skills as measured by the Florida Statewide Assessment Program in October of 1976 are presented in Tables 3,4,6, and 7.

Finally, the effects of one year versus two and three years of participation in Dade Systems programs on communications and mathematics skills achievement, as presented in Tables 8-11, are discussed.

PROGRAM IMPLEMENTATION CHARACTERISTICS

Examination of Table 1, which presents the number of pupils and teachers who were reportedly involved with various systems and non-systems programs, indicates there were approximately 122,945 pupils in Dade elementary grades K-6 as of April 1976. Of that number of pupils, 96,940, or 79 percent, were receiving reading instruction via a diagnostic/prescriptive systems program, and 92,201,or 75 percent, were receiving math instruction within a systems program format. This represents an increase of 37,774 systems reading and 35,680 systems math participants over last years' figures. Also 3,178 of Dade's 6,580 K-6 teachers were involved with systems math programs and 3,402 of them were using systems reading programs.

As was the case last year, Dade County's Systems approaches accommodated the majority of all systems pupils. Sixty-three percent of the pupils in reading systems were in Dade's Reading System and 90 percent of the systems math pupils received their math instruction via Dade's Math System. The sizeable difference in the percentage of Dade Reading and Dade Math Systems programs that were implemented in relation to the total systems programs implemented within the schools occurred because Dade's Reading System was very rarely used at the kindergarten level, less than five percent of the time, and only 47 percent of the time at grade one, whereas, Dade's Math System was the system used 85 percent of the time at the kindergarten level and 90 percent of the time at grade one. It should be noted at this time that the Dade Reading System was not initially designed to be used at the kindergarten level.

TABLE 1

NUMBER OF SYSTEMS PUPILS AND TEACHERS WITHIN GRADE LEVELS (K-6) BY TYPE SYSTEM AS OF APRIL, 1976
DISTRICT
F

	MATHEMATICS SYSTEMS GRADE LEVELS														TOTAL	
*TY	K PUPILS	K TEACHRS	1 PUPILS	1 TEACHRS	2 PUPILS	2 TEACHRS	3 PUPILS	3 TEACHRS	4 PUPILS	4 TEACHRS	5 PUPILS	5 TEACHRS	6 PUPILS	6 TEACHRS	PUPILS	TEACHRS
11	110	2	265	11	424	14	686	29	874	35	32	32	1,554	31	4,643	153
12	0	0	0	0	0	0	0	0	34	1	2	2	68	2	104	5
13	0	0	0	0	35	2	27	2	66	2	3	3	109	2	311	11
14	109	5	0	0	0	0	0	0	0	0	0	0	0	0	109	5
15	668	22	620	21	316	11	352	14	232	11	13	13	121	10	2,760	102
00	977	29	845	32	775	27	1,065	44	1,206	49	1,557	50	1,650	45	8,103	276
17	5,642	193	8,085	334	9,930	364	11,412	391	12,224	391	11,196	365	12,836	363	71,365	2,401
TM	6,019	222	9,773	366	10,725	391	12,477	435	13,430	440	12,733	415	14,336	408	79,498	2,677
**	READING SYSTEMS GRADE LEVELS															
21	57	1	295	11	366	11	30	1	47	1	0	0	0	0	725	25
22	1	1	192	6	121	8	420	19	260	17	384	15	141	4	1,609	70
23	0	0	299	10	271	14	435	17	531	15	973	17	905	15	3,414	88
24	112	2	1,018	32	799	23	1,150	35	1,011	29	658	22	730	25	5,743	186
25	105	4	193	7	196	6	134	4	155	4	146	4	0	0	933	29
26	0	0	0	0	79	4	65	4	0	0	0	0	0	0	144	8
27	0	0	0	0	53	2	224	7	215	7	267	9	210	5	970	30
28	455	18	489	19	330	12	235	8	62	4	204	6	198	5	1,993	72
29	0	0	260	10	211	6	207	8	0	0	0	0	0	0	678	24
30	329	13	303	12	175	7	13	1	0	0	0	0	0	0	820	33
31	6,269	315	550	24	31	5	32	2	0	0	0	0	0	0	8,902	346
32	274	9	359	13	216	6	39	2	37	1	30	1	85	3	1,040	35
33	3	0	26	1	0	0	0	0	40	1	91	2	406	3	569	7
34	373	10	881	30	495	17	411	14	260	9	247	12	363	8	2,920	100
00	9,490	373	4,771	162	3,253	128	3,395	122	2,781	88	3,162	94	3,038	68	30,410	1,055
37	326	15	3,702	154	6,527	241	8,372	290	10,133	333	9,735	321	10,262	313	49,049	1,673
TR	10,328	386	8,473	336	9,760	369	11,767	420	12,914	421	12,917	415	13,900	381	80,079	2,728
TOTAL SYSTEMS PROGRAMS GRADE LEVELS																
TM	6,019	222	9,773	366	10,725	391	12,477	435	13,430	440	12,733	415	14,336	406	79,498	2,677
TR	10,328	386	8,473	336	9,760	369	11,767	420	12,914	421	12,917	415	13,900	381	80,079	2,728
GT	16,347	608	18,251	702	20,505	760	24,244	855	26,344	861	25,650	830	28,236	789	159,577	5,405

TY = Types of systems programs used for math and reading** instruction in Dade County. Specific systems programs corresponding to the numbers in the TY column are as follows: 11) Individualized Math Systems (IMS), 12) Individualized Program Instruction, 13) Appleton Century Croft (New Century Education), 14) Early Chilhood Mathematics Program, 15) Other Math Systems, **21) Wisconsin Design for Reading Skills, 22) Wisconsin Design/Dade Systems, 23) High Intensity Learning System, 24) READ System (American Book), 25) Criterion Reading (Random House), 26) Fountain Valley Teacher Support System, 27) Appleton Century Croft (New Century), 28) Holt Basic Reading Systems, 29) Design for Reading Series (Harper Row), 30) Reading Systems (Scott Foresman), 31) SWRL Reading Program, 32) Series R, (MacMillan), 34) Other Reading System, 37 = Dade Reading Systems.

PROGRAM IMPACT ON PUPIL ACHIEVEMENT

For discussion purposes the results which follow are presented in two broad categories: 1) Reading Skills Development, and 2) Mathematics Skills Development. Reading skills achievement will be discussed first, in terms of reading comprehension skills as measured by the Stanford Achievement Test and next, in terms of more specific communication skills as measured by the Florida State Assessment test. Mathematics skills will be discussed in the same manner.

IMPACT ON READING ACHIEVEMENT

Reading Comprehension, Stanford Achievement Test, May 1976. It becomes apparent upon examination of Table 2 for program effects on mean gains and reading comprehension within each grade level that the mean gain differences, where they occur, are generally small (less than +.3 or -.3) and any one score within a specific stanine cluster or grade level provides little information. However, when comparisions are made across grade levels and programs the following trends of program differences become apparent.

Pupils in the Dade, Wisconsin Design/Dade System, Holt Reading Systems and non-systems pupils performed as well as expected, whereas pupils in the High Intensity system performed less well than expected. READ and "Other" systems participants also performed less well than expected but overall their performance was not as poor as that of High Intensity participants.

Communication Skills, Florida State Assessment, October, 1975. Results are presented in Tables 3 and 4 and afford a comparison of the number and percent of state assessment items, within clusters of objectives, which are achieved by participants in various systems reading and non-systems reading programs.

At grade three, overall Dade Reading Systems pupils tended to achieve a slightly higher percentage of communication skills items than READ, Series R (MacMillan) and "other" reading systems participants and non-system pupils. However, Holt and Wisconsin/Dade Systems pupils achieved a slightly higher percentage of communication skills items than pupils involved in all other programs.

Table 3 also demonstrates that third grade pupils (within all stanine clusters who received reading instruction via a systems program) obtained a higher percentage of communication skills items, in all categories of objectives, than non-systems pupils.

At grade five, Dade and the READ Systems participants performed equally well and slightly better than participants of other commercial systems reading programs and non-systems reading programs.

Reading Comprehension and Communication Skills. Interestingly, communication skills performance patterns are similar to those demonstrated for reading comprehension skills achievement as measured by the Stanford. Dade and Wisconsin/ Dade Reading Systems pupils along with Holt reading pupils performed slightly better than other systems participants and non-systems programs; the High Intensity program participants performed less well than was expected.

TABLE 2

DISTRICT READING ADJUSTED MEAN GAIN SCORES
COMPARISONS OF SYSTEMS AND NON SYSTEMS PUPILS BY STANINE RANGE
ON THE STANFORD ACHIEVEMENT TEST APRIL 1976
FULLY IMPLEMENTED READING COMPREHENSIVE

	TYPES OF READING PROGRAMS		STANINES 1-3		STANINES 4-6		STANINES 7-9		STANINES 1-9	
			MEAN GAINS	NUMBER PUPILS	MEAN GAINS	NUMBER PUPILS	MEAN GAINS	NUMBER PUPILS	MEAN GAINS	NUMBER PUPILS
2	WISCON DECODING & COMPREHND	21		17	+0.0	97	+0.0	98	+0.0	212
	WISCON DSGN/DADE SYST	22		6	+0.1	43	+0.2	53	+0.1	99
	HIGH INTENSITY LRN SYST	23	-0.1	97	+0.0	61		1	-0.1	159
	READ SYST (AM BK)	24	-0.1	125	-0.2	348	-0.2	73	-0.2	546
	CRITERION READING (RANDM HSE)	25		28	+0.0	73	+0.0	33	+0.0	134
	FONTN VALY TECHR SUPRT SYST	26		8	-0.1	49		4	+0.0	57
	HOLT BASIC READING SYSTS	28		18	+0.1	137	+0.1	54	+0.1	209
	DESGN FR READ SERES (HPER ROW)	29	-0.1	36	+0.0	86		4	+0.0	126
	READING SYSTEMS (SCOT FRSMN)	30		22	+0.2	91	+0.2	36	+0.1	149
	SERIES R (MACMILLAN)	32	+0.0	50	+0.2	67	+0.6	44	+0.2	161
	OTHER READING SYSTEMS	34	+0.0	134	+0.0	131	+0.0	69	+0.0	334
	DADE READING SYSTEMS	37	+0.0	884	+0.0	2,491	+0.0	1,183	+0.0	4,513
	NON SYSTEMS READING		+0.0	212	+0.0	605	+0.0	288	+0.0	1,125
3	WISCON DSGN/DADE SYST	22		19	+0.0	151	+0.0	159	+0.0	328
	HIGH INTENSITY LRN SYST	23	+0.0	198	-0.3	137		15	-0.1	350
	READ SYST (AM BK)	24	+0.0	287	+0.0	423	+0.1	116	+0.0	826
	CRITERION READING (RANDM HSE)	25		29	+0.0	50		6	+0.0	85
	FONTN VALY TECHR SUPRT SYST	26		9	+0.0	54		10	+0.0	73
	APLTN CNTRY CRFT (NEW CNTR ED)	27	-0.2	129	-0.3	36		1	-0.2	166
	HOLT BASIC READING SYSTS	28		22	+0.1	94	+0.1	41	+0.1	157
	DESGN FR READ SERES (HPER ROW)	29	-0.1	45	+0.0	89		15	+0.0	149
	SERIES R (MACMILLAN)	32		27		8		0	-0.5	35
	OTHER READING SYSTEMS	34	-0.2	115	+0.0	106	+0.2	78	+0.0	299
	DADE READING SYSTEMS	37	+0.0	957	+0.0	3,557	+0.0	1,894	+0.0	6,409
	NON SYSTEMS READING		+0.0	166	+0.0	504	+0.0	163	+0.0	833
4	WISCON DSGN/DADE SYST	22		11	+0.0	128	+0.0	179	+0.0	318
	HIGH INTENSITY LRN SYST	23	-0.1	220	-0.2	168		8	-0.2	396
	READ SYST (AM BK)	24	+0.0	146	+0.0	321	-0.1	78	+0.0	545
	CRITERION READING (RANDM HSE)	25	-0.1	32	+0.0	54		15	-0.1	101
	APLTN CNTRY CRFT (NEW CNTR ED)	27	+0.0	109	+0.0	34		4	+0.0	147
	HOLT BASIC READING SYSTS	28		7		22		13	+0.0	42
	VERBAL SKLS CRICLM (NEW CNTRY)	33		13		25		3	+0.0	41
	OTHER READING SYSTEMS	34	+0.1	77	+0.2	64		16	+0.2	157
	DADE READING SYSTEMS	37	+0.0	1,241	+0.0	4,239	+0.0	2,269	+0.0	7,749
	NON SYSTEMS READING		+0.0	222	+0.0	623	-0.1	199	+0.0	1,046
5	WISCON DSGN/DADE SYST	22		23	+0.2	151	+0.3	140	+0.2	314
	HIGH INTENSITY LRN SYST	23	-0.1	404	-0.1	342		23	-0.1	769
	READ SYST (AM BK)	24	+0.0	202	+0.0	381	-0.4	38	+0.0	621
	CRITERION READING (RANDM HSE)	27		24	+0.0	53		12	+0.0	89
	APLTN CNTRY CRFT (NEW CNTR ED)	28	-0.1	114	+0.0	108		3	+0.0	225
	HOLT BASIC READING SYSTS	32		16	+0.0	95	+0.1	49	+0.0	160
	VERBAL SKLS CRICLM (NEW CNTRY)	33	+0.1	31	-0.1	37		2	+0.0	70
	OTHER READING SYSTEMS	34	-0.1	42	-0.1	51	+0.0	90	-0.1	183
	DADE READING SYSTEMS	37	+0.0	1,314	+0.0	4,387	+0.0	1,958	+0.0	7,659
	NON READING SYSTEMS		+0.0	262	-0.1	750	+0.0	259	+0.0	1,271
6	WISCON DSGN/DADE SYST	22		4	+0.1	59	+0.0	55	0.0	118
	HIGH INTENSITY LRN SYST	23	+0.0	435	-0.5	263		28	-0.2	726
	READ SYST (AM BK)	24	-0.1	280	-0.2	284		16	-0.2	580
	APLTN CNTRY CRFT (NEW CNTR ED)	27	-0.1	60	+0.0	81		5	+0.0	146
	HOLT BASIC READING SYSTS	28	+0.0	40	+0.0	96	+0.2	33	+0.0	169
	SERIES R (MACMILLAN)	32	-0.4	35		25		1	-0.1	61
	VERBAL SKLS CRICLM (NEW CNTRY)	33	-0.2	124	-0.3	104		22	-0.2	250
	OTHER READING SYSTEMS	34	-0.3	50	+0.0	105	+0.1	134	+0.0	294
	DADE READING SYSTEMS	37	+0.0	1,686	+0.0	4,553	+0.0	2,294	+0.0	8,933
	NON SYSTEMS READING		+0.0	391	+0.0	556	+0.0	470	+0.0	1,817

1. AN ADJUSTED MEAN GAIN SCORE IS THE DIFFERENCE (FRACTIONAL PART OF A YEAR ABOVE (+) OR BELOW (-) GRADE LEVEL) BETWEEN THE AVERAGE GRADE LEVEL ACTUALLY OBTAINED BY PUPILS IN A GROUP IN RELATION TO WHAT THEY WERE EXPECTED TO OBTAIN ON THE STANFORD ACHIEVEMENT TEST.

2. THE DIFFERENCE IS FOUND BY SUBTRACTING THE EXPECTED SCORE FROM THE ACTUAL SCORE. POSITIVE AND NEGATIVE DIFFERENCES INDICATE, RESPECTIVELY, THE EXTENT TO WHICH PUPILS SCORED HIGHER OR LOWER THAN SIMILAR PUPILS ATTENDING OTHER DADE SCHOOLS. MEAN GAIN DIFFERENCES FROM -0.3 THROUGH +0.3 GRADE EQUIVALENT UNITS SHOULD GENERALLY BE DISCOUNTED AND INTERPRETED AS "ABOUT AS EXPECTED".

3. STANINE CLUSTERS ARE BASED ON MAY 1975 STANFORD ACHIEVEMENT DATA.

TABLE 3

PERCENTAGE OF COMMUNICATION SKILLS - STATE ASSESSMENT ITEMS ACHIEVED
A COMPARISON OF THE PERCENT OF STATE ASSESSMENT ITEMS WITHIN SPECIFIC CLUSTERS OF OBJECTIVES, WHICH WERE ACHIEVED BY VARIOUS SYSTEMS READING AND NON SYSTEMS READING PUPILS - BY CATEGORY - BY STANINE RANGE ON THE 1975 STANFORD COMMUNICATION SKILLS
GRADE 03 - STANINE CLUSTER 1-3, 4-6, 7-9

		PERCENT OF COMMUNICATION SKILLS ITEMS ACHIEVED						NUMBER
	TYPES OF READING PROGRAMS	DECODING 19 ITEMS	VOCABULARY 3 ITEMS	COMPREHENSION 21 ITEMS	STUDY SKILLS 8 ITEMS	WRT RELATED COMM SKLS 30 ITEMS	TOT COMM SKILLS 81 ITEMS	OF PUPILS
1-3	READ SYST (AM BK)	85.0	39.8	51.6	72.0	64.6	65.8	62
	SERIES R (MACMILLAN)	86.8	44.1	55.7	72.1	66.2	68.1	34
	OTHER READING SYSTEMS	81.5	37.6	48.7	60.8	57.7	60.5	86
	DADE READING SYSTEMS	83.9	40.8	53.4	69.0	64.1	65.6	389
	NON-SYSTEMS READING	80.8	40.4	49.3	66.2	62.1	62.8	337
4-6	WISCON DSGN/DADE SYST.	97.7	71.5	76.1	83.5	84.6	84.9	41
	READ SYST (AM BK)	92.7	66.4	70.6	83.9	79.9	80.4	211
	CRITERION READING (RANDM HSE)	96.3	64.4	73.5	78.8	79.0	81.1	59
	HOLT BASIC READING SYSTS	96.7	72.7	80.7	86.8	86.5	86.9	89
	SERIES R (MACMILLAN)	96.3	78.5	81.3	88.6	83.9	86.4	45
	OTHER READING SYSTEMS	90.4	54.4	67.7	73.1	73.2	75.1	65
	DADE READING SYSTEMS	93.8	67.0	73.9	82.7	80.0	81.4	1044
	NON-SYSTEMS READING	93.4	62.2	69.9	80.0	78.0	79.1	641
7-9	WISCON DSGN/DADE SYST.	99.2	91.7	94.5	94.9	96.7	96.4	44
	READ SYST (AM BK)	98.8	33.9	87.2	91.2	91.7	91.8	64
	HOLT BASIC READING SYSTS	99.7	89.2	94.3	98.0	94.2	95.7	31
	SERIES R (MACMILLAN)	97.6	87.9	92.5	95.1	91.8	93.5	33
	OTHER READING SYSTEMS	99.6	92.4	92.0	95.8	94.9	95.2	48
	DADE READING SYSTEMS	98.9	90.3	90.8	94.2	93.3	93.9	483
	NON-SYSTEMS READING	97.4	85.2	88.2	92.5	91.3	91.8	290

TABLE 4

PERCENTAGE OF COMMUNICATION SKILLS - STATE ASSESSMENT ITEMS ACHIEVED
A COMPARISON OF THE PERCENT OF STATE ASSESSMENT ITEMS WITHIN SPECIFIC CLUSTERS OF OBJECTIVES, WHICH WERE ACHIEVED BY VARIOUS SYSTEMS READING AND NON SYSTEMS READING PUPILS - BY CATEGORY - BY STANINE RANGE ON THE 1975 STANFORD COMMUNICATION SKILLS
GRADE 05 - STANINE CLUSTER 1-3, 4-6, 7-9

		PERCENT OF COMMUNICATION SKILLS ITEMS ACHIEVED						NUMBER
	TYPES OF READING PROGRAMS	DECODING 10 ITEMS	VOCABULARY 51 ITEMS	COMPREHENSION 38 ITEM	STUDY SKILLS 12 ITEMS	ART RELATED COMM SKLS 35 ITEMS	TOT CUMM SKILLS 136 ITEMS	OF PUPILS
1-3	HIGH INTENSITY LRN SYST	C.0	65.8	47.8	47.2	55.1	56.4	140
	CADE READING SYSTEMS	C.0	70.0	54.3	52.3	59.2	61.3	651
	NON-SYSTEMS READING	C.0	68.1	51.2	50.1	57.0	59.2	275
4-6	HIGH INTENSITY LRN SYST	C.0	82.4	73.0	72.0	77.8	77.7	112
	READ SYST (AM PK)	C.0	89.8	80.9	79.9	85.6	85.4	182
	HOLT BASIC READING SYSTS	C.0	86.3	73.4	75.2	79.4	79.9	53
	OTHER READING SYSTEMS	C.0	87.8	81.5	78.2	81.5	83.5	42
	CADE READING SYSTEMS	C.0	89.5	80.5	79.8	84.5	84.4	1934
	NON-SYSTEMS READING	C.0	80.4	76.3	75.5	80.5	81.1	670
7-9	READ SYST (AM PK)	C.0	97.4	94.2	94.3	93.5	95.2	50
	CADE READING SYSTEMS	C.0	96.6	93.0	92.0	94.4	94.6	923
	NON-SYSTEMS READING	C.0	95.5	91.6	89.7	93.2	93.3	194

IMPACT ON MATHEMATICS ACHIEVEMENT

Stanford, 1976, Mathematics Computation results presented in Table 5 afford a comparison of the adjusted mean gain math scores among the Dade Math Systems, various types of non-Dade math systems (commercial and teacher-design), and the non-systems math programs for low (1-3), average (4-6), and high (7-9) stanine clusters of pupils within grades two through six.

Overall, Dade Systems Math pupils performed better on the Stanford Achievement math computation subtest than non-systems, and "other" systems math program participants. IMS and Appleton Century Croft participants performed well, also. IMS pupils in the 7-9 stanine clusters, performed considerably better than expected and better than high achievers in other systems math and non-systems math programs.

Florida State Assessment, Mathematics Skills. Results presented in Tables 6 and 7 afford a comparison of the percentages of mathematics skills achieved by the various math systems and non-systems math programs at grade levels three and five.

Grade level three Dade Systems Math pupils, within stanine clusters 1-3, achieved a higher percentage of mathematic skills items, in all math skills categories, than IMS and non-systems math pupils. Stanine cluster 4-6 Dade System pupils out-performed IMS, "other" systems and non-systems math participants.

Within stanine cluster 7-9 there were too few IMS pupils to permit comparative analyses. However, Dade Systems pupils out-performed "other" systems math and non-systems math program participants in all categories of mathematics objectives.

Overall, Dade Systems Math was the most beneficial math program for the third graders. Program participants achieved a higher percentage of State Assessment mathematics skills items than IMS or "other" systems and non systems pupils.

Grade level five Dade Systems Math participants in stanine clusters 1-3 and 4-6 achieved a higher percentage of mathematics items in all categories of math objectives than did participants of either the non-systems and "other" systems math programs and obtained slightly fewer items than IMS participants.

High achieving, stanine clusters 7-9, Dade Systems pupils performed better than non-systems pupils. However, participants in "other" math systems classes reversed the trend of the 1-3 and 4-6 clusters and performed slightly better than Dade Systems Math participants. IMS participants in the high achievment level cluster also out-performed the Dade Systems Math pupils.

Overall, within stanine clusters 1-3, 4-6, and 7-9, fifth grade IMS participants achieved a higher percentage of mathematics skills items than did Dade Systems Math participants, who in turn out-performed participants in either "other" systems or non-systems math programs.

TABLE 5

DISTRICT MATHEMATICS ADJUSTED MEAN GAIN SCORES
COMPARISONS OF SYSTEMS AND NON SYSTEMS PUPILS BY STANINE RANGE
ON THE STANFORD ACHIEVEMENT TEST APRIL, 1976
FULLY IMPLEMENTED MATH COMPUTATION

	TYPES OF MATHEMATICS PROGRAMS	STANINES 1-3		STANINES 4-6		STANINES 7-9		STANINES 1-9	
		MEAN GAINS	NUMBER PUPILS	MEAN GAINS	NUMBER PUPILS	MEAN GAINS	NUMBER PUPILS	MEAN GAINS	NUMBER PUPILS
2	INDIVID. MATH SYS (IMS) 11	+0.0	112	-0.1	94	+0.0	49	+0.0	255
	APLTN CNTRY CRFT (NEW CNTRY ED) 13		13		14		3	+0.2	30
	OTHER MATH SYSTEM 15	+0.0	109	-0.1	77		23	+0.0	209
	DADE MATH SYSTEM 17	+0.0	1,340	+0.0	3,034	+0.0	1,847	+0.0	6,821
	NON SYSTEMS MATHEMATICS	+0.0	201	+0.0	657	+0.0	289	+0.0	1,147
3	INDIVID. MATH SYS (IMS) 11	-0.1	140	+0.0	205	+0.3	146	+0.0	491
	OTHER MATH SYSTEM 15	-0.1	145	-0.1	109		22	-0.1	276
	DADE MATH SYSTEM 17	+0.0	1,695	+0.0	4,299	+0.0	2,393	+0.0	8,487
	NON SYSTEMS MATHEMATICS	-0.1	184	-0.1	467	-0.3	180	-0.2	831
4	INDIVID. MATH SYS (IMS) 11	+0.1	113	+0.1	294	+0.4	239	+0.2	646
	APLTN CNTRY CRFT (NEW CNTRY ED) 13	+0.2	38		16		0	+0.0	54
	OTHER MATH SYSTEM 15	-0.1	84	-0.4	75		17	-0.2	176
	DADE MATH SYSTEM 17	+0.0	1,611	+0.0	4,916	+0.0	2,395	+0.0	8,922
	NON SYSTEMS MATHEMATICS	-0.1	210	-0.1	627	-0.1	204	-0.1	1,041
5	INDIVID. MATH SYS (IMS) 11	+0.0	104	+0.1	333	+0.3	233	+0.2	730
	INDIVID. PROGRM INST (IPI) 12		1		10	+0.0	33	+0.0	44
	APLTN CNTRY CRFT (NEW CNTRY ED) 13	+0.0	47		16		2	+0.0	65
	OTHER MATH SYSTEM 15	-0.1	178	-0.2	203		28	-0.2	409
	DADE MATH SYSTEM 17	+0.0	1,871	+0.0	4,520	+0.0	2,135	+0.0	8,526
	NON SYSTEMS MATHEMATICS	+0.0	289	+0.0	679	-0.2	302	-0.1	1,270
6	INDIVID. MATH SYS (IMS) 11	-0.1	254	+0.0	511	+0.2	319	+0.0	1,084
	INDIVID. PROGRM INST (IPI) 12		1		26		27	-0.1	54
	APLTN CNTRY CRFT (NEW CNTRY ED) 13		28	+0.3	50		11	+0.3	89
	OTHER MATH SYSTEM 15	-0.1	69	-0.5	39		0	-0.3	108
	DADE MATH SYSTEM 17	+0.0	2,530	+0.0	5,518	+0.0	2,264	+0.0	10,312
	NON SYSTEMS MATHEMATICS	+0.0	434	+0.0	947	+0.0	431	+0.0	1,812

1. AN ADJUSTED MEAN GAIN SCORE IS THE DIFFERENCE (FRACTIONAL PART OF A YEAR ABOVE (+) OR BELOW (-) GRADE LEVEL) BETWEEN THE AVERAGE GRADE LEVEL ACTUALLY OBTAINED BY PUPILS IN A GROUP IN RELATION TO WHAT THEY WERE EXPECTED TO OBTAIN ON THE STANFORD ACHIEVEMENT TEST.

2. THE DIFFERENCE IS FOUND BY SUBTRACTING THE EXPECTED SCORE FROM THE ACTUAL SCORE. POSITIVE AND NEGATIVE DIFFERENCES INDICATE, RESPECTIVELY, THE EXTENT TO WHICH PUPILS SCORED HIGHER OR LOWER THAN SIMILAR PUPILS ATTENDING OTHER DADE SCHOOLS. MEAN GAIN DIFFERENCES FROM -0.3 THROUGH +0.3 GRADE EQUIVALENT UNITS SHOULD GENERALLY BE DISCOUNTED AND INTERPRETED AS ABOUT AS EXPECTED.

3. STANINE CLUSTERS ARE BASED ON MAY 1975 STANFORD ACHIEVEMENT DATA.

TABLE 6

PERCENTAGE OF MATHEMATICS - STATE ASSESSMENT ITEMS ACHIEVED
A COMPARISON OF THE PERCENT OF STATE ASSESSMENT ITEMS WITHIN SPECIFIC CLUSTERS OF OBJECTIVES, WHICH WERE ACHIEVED BY VARIOUS SYSTEMS MATH AND NON SYSTEMS MATH PUPILS - BY CATEGORY - BY STANINE RANGE ON THE 1975 STANFORD MATHEMATICS SKILLS
GRADE 03 - STANINE CLUSTER 1-3, 4-6, 7-9

	TYPES OF MATHEMATICS PROGRAMS		PERCENT OF MATHEMATICS ITEMS ACHIEVED					NUMBER OF PUPILS
			CONCEPTS 10 ITEMS	COMPUTATION 33 ITEMS	PROBLEM SOLVING 9 ITEMS	OTHER MATH SKILLS 3 ITEMS	TOTAL OBJECTIVES 64 ITEMS	
1-3	INDIVID. MATH SYS (IMS)	11	75.3	59.9	45.1	67.9	62.7	52
	OTHER MATH SYSTEM	15	80.7	60.0	54.0	78.8	66.2	66
	CADE MATH SYSTEM	10	80.4	63.4	56.2	70.2	67.8	1092
	NON SYSTEMS MATHEMATICS		76.9	60.5	53.6	64.4	64.6	299
4-6	INDIVID. MATH SYS (IMS)	11	85.7	69.8	55.9	77.4	72.9	31
	OTHER MATH SYSTEM	15	88.6	75.1	70.2	85.5	78.9	33
	CADE MATH SYSTEM	10	90.6	82.2	76.7	85.7	84.1	3108
	NON SYSTEMS MATHEMATICS		89.7	79.9	75.7	82.7	82.4	700
7-9	CADE MATH SYSTEM	10	95.0	92.3	91.3	94.5	93.2	1612
	NON SYSTEMS MATHEMATICS		94.2	90.6	87.4	93.2	91.3	289

TABLE 7

PERCENTAGE OF MATHEMATICS - STATE ASSESSMENT ITEMS ACHIEVED
A COMPARISON OF THE PERCENT OF STATE ASSESSMENT ITEMS WITHIN SPECIFIC CLUSTERS OF OBJECTIVES, WHICH WERE ACHIEVED BY VARIOUS SYSTEMS MATH AND NON SYSTEMS MATH PUPILS - BY CATEGORY - BY STANINE RANGE ON THE 1973 STANFORD MATHEMATICS SKILLS
GRADE 05 - STANINE CLUSTER 1-3, 4-6, 7-9

	TYPES OF MATHEMATICS PROGRAMS		PERCENT OF MATHEMATICS ITEMS ACHIEVED: CONCEPTS 30 ITEMS	COMPUTATION 26 ITEMS	PROBLEM SOLVING 11 ITEMS	OTHER MATH SKILLS 7 ITEMS	TOTAL OBJECTIVES 74 ITEMS	NUMBER OF PUPILS
1-3	INDIVID. MATH SYS (IMS)	11	70.3	53.4	39.6	74.4	62.1	73
	OTHER MATH SYSTEM	15	59.1	46.7	25.8	59.4	49.8	70
	CADE MATH SYSTEM	10	63.3	52.5	37.6	65.1	56.1	1242
	NON SYSTEMS MATHEMATICS		62.9	51.9	33.4	62.5	54.5	254
4-6	INDIVID. MATH SYS (IMS)	11	83.3	79.1	65.8	84.6	79.4	194
	OTHER MATH SYSTEM	15	64.6	55.1	35.5	61.1	56.6	72
	CADE MATH SYSTEM	10	77.2	72.3	57.5	78.9	72.7	3640
	NON SYSTEMS MATHEMATICS		73.7	67.9	51.8	74.7	68.5	670
7-9	INDIVID. MATH SYS (IMS)	11	93.2	94.1	88.9	91.4	92.7	143
	CADE MATH SYSTEM	10	88.6	89.6	81.9	88.4	87.9	1825
	NON SYSTEMS MATHEMATICS		85.9	87.1	79.1	86.7	85.4	207

EFFECTS OF THE SECOND AND THIRD YEAR OF PARTICIPATION IN DADE'S READING AND MATH SYSTEMS

Results presented in Tables 8-9 demonstrate 1) that Dade Systems Math and Reading pupils perform significantly better with a second year of program participation, and 2) that the tremendous gains made between the first and second year of participation stabilized by the third year for Dade Systems Math pupils, but not for Dade Systems Reading pupils. Reading program participants continued to perform slightly better with a third year in the program.

A possible explanation for this occurrence might lie in the difference in the complexity of the processes of developing communication skills in relation to the complexity of the task of developing arithmetic skills. Generally, the more complex the task, the longer period of time needed to master the skills specific to the task.

Tables 10 and 11 permit achievement comparisons among one- year, two-year and three- year Dade Systems Reading and Math pupils and non-systems reading and math pupils within low, average, and high achieving fifth- grade pupils.

Examination of those tables clearly shows that second and third- year Dade Systems Reading and Math pupils obtained a higher percentage of communication and mathematics skills on the October, 1976, State Assessment Test than non-systems reading and math pupils. This was true for pupils of all achievement levels - low, average, and high.

TABLE 8

COMMUNICATIONS SKILLS ACHIEVEMENT COMPARISONS
FOR FIRST, SECOND AND THIRD THIRD YEAR - DADE SYSTEMS READING PUPILS
A COMPARISON OF COMMUNICATIONS SKILLS - STATE ASSESSMENT ITEMS, WITHIN SPECIFIC
CLUSTER OF OBJECTIVES, ACHIEVED BY FIRST, SECOND AND THIRD YEAR - DADE SYSTEMS READING PUPILS
GROUPED BY STANINE CLUSTERS ON THE 1974 STANFORD

GRADE 05 - COMMUNICATION SKILLS

PERCENT OF COMMUNICATIONS SKILLS ITEMS ACHIEVED

STANINE CLUSTERS		DECODING (0) ITEMS			VOCABULARY (51) ITEMS			COMP SKILLS (12) ITEMS			STUDY SKILLS (38) ITEMS			WRT RELATED SKILLS (35) ITEMS			TOTAL COMM SKILLS (136) ITEMS		
		1ST	2ND	3RD	1ST	2ND	3RD	1ST	2ND	3RD	1ST	2ND	3RD	1ST	2ND	3RD	1ST	2ND	3RD
1-3	X	NA	NA	NA	66.8	75.4	78.0	50.9	60.7	62.0	51.0	59.5	60.7	58.1	65.3	69.0	58.7	67.3	69.7
	N	NA	NA	NA	57	183	57	57	183	57	57	183	57	57	183	57	57	183	57
4-6	X	NA	NA	NA	87.7	88.5	91.9	80.6	79.6	83.1	76.6	78.7	81.6	81.4	83.4	86.3	83.1	83.8	87.1
	N	NA	NA	NA	47	607	181	47	607	181	47	607	181	47	607	181	47	607	181
7-9	X	NA	NA	NA		96.4	95.5		92.5	91.8		91.9	91.4		94.9	93.9		94.5	93.7
	N	NA	NA	NA	4	242	158	4	242	158	4	242	158	4	242	158	4	242	158
1-9	X	NA	NA	NA	76.9	88.1	91.3	65.0	79.3	83.6	63.3	78.4	82.5	69.6	82.9	86.8	70.5	83.4	87.2
	N	NA	NA	NA	108	1032	396	108	1032	396	108	1032	396	108	1032	396	108	1032	396

FIRST YEAR, 1ST., = PUPILS WHO FIRST EXPERIENCED THE DADE SYTEMS READING OR MATH PROGRAMS DURING THE 1975-76 SCHOOL YEAR AND WHO COMPLETED FIVE MONTHS OF INSTRUCTION WITHIN THE SYSTEM.

SECOND YEAR, 2ND., = PUPILS WHO EXPERIENCED A SECOND YEAR OF DADE SYSTEM PROGRAMS DURING THE 1975-76 SCHOOL YEAR WITH A MINIMUM OF FIVE MONTHS PARTICIPATION EACH YEAR.

THIRD YEAR, 3RD., = PUPILS WHO EXPERIENCED A THIRD YEAR OF DADE SYSTEM PROGRAMS DURING THE 1975-76 SCHOOL YEAR WITH A MINIMUM OF FIVE MONTHS PARTICIPATION EACH YEAR.

DECODING ITEMS = (0), THEREFORE, THE PERCENT OF COMM. SKILLS ITEMS ACHIEVED FIGURES ARE NOT AVAILABLE (NA).

TABLE 9

MATHEMATICS SKILLS ACHIEVEMENT COMPARISONS
FOR FIRST, SECOND AND THIRD YEAR DADE SYSTEMS MATHEMATICS PUPILS
A COMPARISON OF MATHEMATICS SKILLS - STATE ASSESSMENT ITEMS WITHIN SPECIFIC
CLUSTERS OF OBJECTIVES, ACHIEVED BY FIRST, SECOND AND THIRD YEAR - DADE SYSTEMS MATH PUPILS
GROUPED BY STANINE CLUSTERS ON THE 1974 STANFORD
GRADE 05 MATHEMATICS SKILLS
PERCENT OF MATHEMATICS SKILLS ITEMS ACHIEVED

STANINE CLUSTERS		CONCEPTS (30) ITEMS			COMPUTATION (26) ITEMS			PROBLEM SOLVING (11) ITEMS			OTHER MATH SKILLS (07) ITEMS			TOTAL OBJECTIVES (74) ITEMS		
		1ST	2ND	3RD	1ST	2ND	3RD	1ST	2ND	3RD	1ST	2ND	3RD	1ST	2ND	3RD
1-3	%	60.0	64.8	65.0	50.0	53.9	54.2	30.7	37.5	37.8	59.9	66.5	66.0	52.3	57.1	57.2
	N	121	277	214	121	277	214	121	277	214	121	277	214	121	277	214
4-6	%	72.5	79.5	79.4	63.5	75.0	77.3	48.2	61.7	64.2	74.2	81.7	80.6	65.9	75.5	76.5
	N	132	789	515	132	789	515	132	789	515	132	789	515	132	789	515
7-9	%		88.5	89.9		83.1	89.5		81.0	83.2		88.2	88.5		87.2	88.6
	N	19	347	181	19	347	181	19	347	181	19	347	181	19	347	181
1-9	%	67.8	78.8	78.1	58.9	74.1	74.3	41.8	61.7	61.8	68.5	80.3	78.7	60.9	74.8	74.4
	N	272	1413	910	272	1413	910	272	1413	910	272	1413	910	272	1413	910

FIRST YEAR, 1st., = PUPILS WHO FIRST EXPERIENCED THE DADE SYSTEMS READING OR MATH PROGRAMS DURING THE 1975-76 SCHOOL YEAR AND WHO COMPLETED FIVE MONTHS OF INSTRUCTION WITHIN THE SYSTEM.

SECOND YEAR, 2nd., = PUPILS WHO EXPERIENCED A SECOND YEAR OF DADE SYSTEM PROGRAMS DURING THE 1975-76 SCHOOL YEAR WITH A MINIMUM OF FIVE MONTHS PARTICIPATION EACH YEAR.

THIRD YEAR, 3rd., = PUPILS WHO EXPERIENCED A THIRD YEAR OF DADE SYSTEM PROGRAMS DURING THE 1975-76 SCHOOL YEAR WITH A MINIMUM OF FIVE MONTHS PARTICIPATION EACH YEAR.

TABLE 10

GRADE FIVE TOTAL COMMUNICATIONS SKILLS
COMPARISONS AMONG FIRST, SECOND AND
THIRD YEAR DADE SYSTEMS READING PUPILS AND
NON-SYSTEMS READING PUPILS

DADE READING SYSTEM	STANINE CLUSTERS			
	1-3	4-6	7-9	1-9
First Year Dade System	59	83	—	71
Second Year Dade System	67	84	95	83
Third Year Dade System	70	87	94	87
NON-SYSTEMS READING	59	81	93	78

TABLE 11

GRADE FIVE TOTAL MATHEMATICS SKILLS
COMPARISONS AMONG FIRST, SECOND AND
THIRD YEAR DADE SYSTEMS MATH PUPILS AND
NON-SYSTEMS MATH PUPILS

DADE MATH SYSTEM	STANINE CLUSTERS			
	1-3	4-6	7-9	1-9
First Year Dade System	52	66	—	61
Second Year Dade System	57	76	87	75
Third Year Dade System	57	77	89	74
NON-SYSTEMS MATH	55	69	85	69